

The Planters' Chronicle.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We wish all our readers a Merry Christmas and a Prosperous New Year and trust that Nineteen Fourteen will bring continued and increasing prosperity to all those engaged in those industries that go to form this Association.

The Scientific Officer contributes an interesting paper dealing with the mixing of Fertilisers and includes some valuable remarks from Mr. Birnie, the Agricultural Officer of the Potash Syndicate.

A short report of the Proceedings of the Wynad Planters' Association is printed.

A very interesting article on the Prevention of Malaria is taken from the "United Empire." In these days when every individual labourer is an asset, it is necessary to study their health. This is an article that should be closely read, and we regret that all of it cannot be published in this issue but hope to conclude it in next week's.

The article on "Legislation and Plant Sanitation" which we reproduce from the "India Rubber Journal" should receive due attention. The necessity of some form of legislation throughout India has been recognised by this Association. What has been done in the Colonies and in America must be done here. The Pest Act which the Government of India is introducing is to prevent the importation of diseased plants and seeds. We hope, that this is only a first step and that later we may hope to have certain areas that are effected by any known damaging disease proclaimed and proscribed. But to secure this desired object, concerted and continued effort will be required.

Our Correspondence columns show only one letter but that is a very interesting one on "Green Bug" from Mr. Cayley, who gives us the benefit of his experience which is worth a ton of theory.

We would again like to call the attention of our readers and Members of the District Associations to the fact that we have a surplus stock of the discussion on the Labour Question printed separately for circulation in England.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

The Planting Expert returned to head-quarters on 15th December after attending a Meeting of the Board of Agriculture held at Coimbatore. The Chairman of the U. P. A. S. I. and the Planting Member were also present at the Meeting and the opportunity was taken to discuss in an informal manner with those experts of the Indian and Madras Governments most directly concerned the feasibility of introducing local legislation in the nature of a Pest Act, more especially to control the spread of Green Bug in Mysore and Coorg. Much of the matter before the Board was of only indirect interest to the planting community, but the discussion upon subjects like Agricultural Education, Dairying and Fruit culture, which occupied a considerable amount of the time are of general interest to all concerned with Agriculture in India. The Proceedings of the Board will be published in due course and an account of the Meeting has appeared in some detail in the Press so that further space need not be devoted to it here.

From 15th October to 2nd December the Planting Expert was occupied with a tour of the West Coast extending from Calicut in the North to Quilon in the South and including the districts of Malabar, Mundakayam, Peermade, and South Travancore. Twenty-four separate estates were visited and three planters meetings attended and much valuable and interesting information collected. It is not proposed to publish any definite report upon this tour in the *Chronicle*, but the more important problems will be discussed and commented upon during the next few issues in this section.

The Planting Expert does not expect to leave head-quarters again until the beginning of the New Year, and will devote his time until then to Correspondence and a certain amount of laboratory work.

Mixing of Fertilisers.—In connection with the demonstration of how to mix fertilisers on estates reported on page 532 of the present volume of the *Planters' Chronicle*, a correspondent wrote to point out that Slag and Nitrolim both contain free lime, while Steamed Bone as treated in India and according to the analysis contains the same amount of Nitrogen as ordinary ground Bone and that consequently the mixture made at Pollibetta was contrary to the rule that Lime should not be mixed with Nitrogenous fertilisers. It was pointed out in reply that Steamed Bone is usually employed for its Phosphoric Acid content and the amount of Nitrogen in it is so small that the actual loss on mixing it with Lime is also small. The chief loss occurs when Lime, or lime containing fertilisers are mixed with artificials like Sulphate of Ammonia or Nitrates. In the case of this demonstration an ideal mixture was not aimed at but rather a balanced fertiliser containing the most common materials used, the demonstration being of *how* to mix rather than of *what* to mix. It is difficult to get a perfect mixture and though no doubt it would be better not to mix Steamed Bone with Lime still it is a mixture often made and the loss is so small as to be negligible. The matter was referred to Mr. R. Birnie, the Agricultural Officer of the Potash Syndicate, who was kind enough to give the mixing demonstration referred to and Mr. Birnie has written the following letter which will prove of great interest and value to all planters concerned with mixing manures:—

"The Steamed Bone Meal on the Indian market is of two different kinds, viz:—(a) Steamed Bone Meal properly so called, a dusty, whitish material in the manufacture of which the bones have actually been steamed, and (b) a greyish brown material of a more or less granular

"nature derived from bones which have been long exposed to the sun and" "which as a consequence are dry and somewhat brittle. These bones are" "often not steamed at all, but merely pulverised and sold as 'Steamed'" "Bone Meal, because the Phosphoric Acid contained in them is much" "more readily available than that contained in the Bone Meal derived" "from the disintegration of fresh raw bones. The second variety contains" "more Nitrogen than the former, some 3½%, I think speaking from memory."

"Though, according to theory, one should not mix a free-lime-bearing" "fertiliser with Steamed Bone lest this Nitrogen of the latter be lost, yet," "owing to the slowness of the resulting chemical action, and its limited" "extent, in actual practice the mixture is found to be quite a good one if" "made dry and the manure *incorporated with the soil soon after being*" "made. Indeed, if kept dry, the first mentioned variety will keep in" "the mixture without loss for some time. The latter variety, however," "should probably be similarly incorporated with the soil sooner after" "mixing. When well mixed with the soil any resulting chemical" "action of this mixture is so very gentle that the products of manurial" "value are retained by the soil instead of being partly diffused into the" "atmosphere. Hence the reason of this mixture being quite frequently" "used; a contravention of the broad rule of not using a free-lime-bearing" "manure along with Nitrogenous ones, a rule, however, which in its actual" "application contains several permissible exceptions."

Superphosphates in mixtures.—A similar enquiry has been made recently by a correspondent as to the advisability of mixing Lime with Superphosphates. The chief advantage possessed by Superphosphate over other forms of phosphatic fertilisers lies in the fact that the Phosphoric Acid it contains is in a soluble form and thus is more evenly distributed through the Soil, and brought more easily within the range of the roots of the crop. The Phosphoric Acid in Bones and rock phosphates from which superphosphate is made exists in an insoluble form as tricalcic phosphate, and if the Superphosphate is mixed with other manures containing calcium, carbonate, or oxide, tricalcic phosphate may be reformed. Oxide of Iron and Alumina produce the same effect. The changed, or "retrograded" phosphate resulting from such admixtures is insoluble in water, but soluble in Citric Acid, and hence the term 'Citrate soluble phosphate' often applied. Considerable difference of opinion exists as to the agricultural value of these citrate soluble phosphates; some agricultural chemists regard them as being of equal value to the soluble phosphates, while others consider them as only equal in value to the insoluble tricalcic phosphate. As the diffusive power of the phosphoric acid present has been destroyed the latter valuation appears to be the more reasonable. In mixing Superphosphate with other manures there is a danger that this retrogression may take place and the soluble nature of the phosphoric acid, for which an increased price is naturally paid, destroyed. Experiments have shown that in the case of a mixture of Superphosphate and Bone Meal retrogression is small and proceeds only slowly, and Bone Meal is the best form in which to use tricalcic phosphate for mixing with Superphosphate. In a mixture of Superphosphate and Basic Slag, on the other hand, the lime and the oxides of Iron in the latter produce rapid retrogression and this mixture should never be made, while a mixture of Superphosphate and Slaked Lime is still worse. A mixture of Superphosphate and Kainit may safely be made, retrogression in this case being due to the presence of Magnesium Salts, but the amount is small and the action slow.

R. D. A.

DISTRICT PLANTERS' ASSOCIATION.

Wynaad Planters' Association.

*Proceedings of a General Meeting held at the Meppadi Club,
on December 3rd, 1913.*

PRESENT.—Messrs. Gillatt, Macleod, Powell, West and C. E. Abbott (Honorary Secretary). **Visitors:**—Messrs. Blackham and Simpson.

MR. WEST in the chair.

1872. *Proceedings of last Meeting* were confirmed.

1873. *Attesting Contracts in Mysore.*—Read letter from Honorary Secretary to the Resident in Mysore forwarded through Secretary U.P.A.S.I. No reply has been received.

1874. *School of Tropical Medicine.*—Read U. P. A. S. I. circular 23/13 saying that as the Government intend to establish a Pathological Institute at Madras in which extensive facilities will be afforded for teaching Tropical Medicine and for the conduct of Research work connected with Tropical Diseases, it will not contribute to the London School, nor address the Government of India on the the subject.

1875. *Proposal Labour Rules.*—Resolved, that this Meeting thanks the Committee for the trouble it has taken in drawing out the rules which have been circulated to Members of the Association; but is of opinion, that it is undesirable under present circumstances to agree to them. As this resolution will come up for confirmation at the next Meeting, it can, if so wished, be further discussed then.

1876. *Postal Delays.*—Read letter from Mr. G. R. C. Parker. The Honorary Secretary was requested to write to him.

1877. *Non-Execution of Warrants.*—Read details of Mr. West's cases. These were ordered to be printed in full, and will be sent to Members separately.

1878. *Planting Cinchona to supply Government with bark.*—Read circular from U.P. A. S. I.; also several replies received by Honorary Secretary. This Meeting is strongly of opinion that nobody would plant Cinchona in Wynaad to supply Government with bark at the suggested price 7·8d per unit of quinin.

1879. *Weights and Measures.*—No Member of this Association has informed the Honorary Secretary that he desires to give evidence before the Commission. But it is hoped that the U. P. A. S. I. will appoint witnesses to represent it.

A vote of thanks to the chair terminated the Proceedings.

(Signed) ALISTER WEST,
Chairman.

(") * C. E. ABBOTT,
Honorary Secretary.

THE PREVENTION OF MALARIA: ITS RELATIONSHIP TO AGRICULTURE.

BY MALCOLM WATSON, M.D., D. P. H. Klang, F.M.S.

When our Chairman's great discovery, that the mosquito carried malaria, was announced, its far-reaching importance was instantly recognised by all countries with tropical possessions, and also by those in temperate climates where malaria existed. Our own Government in conjunction with the Royal Society at once sent a Commission to India and Africa. The German Government sent the great Koch to the East Indies, and tropical research entered a new path hitherto almost completely neglected.

It is not my purpose to-night to show how this line of research has resulted in a series of discoveries relating to yellow fever, relapsing fever, sleeping sickness, Malta fever, plague, &c., without parallel in the history of medicine; I wish rather to confine myself to malaria. Almost at once, two lines of attack on the disease developed. The Germans, French, and Italians proposed to eradicate the disease by the use of quinine. Of this I can only say, from extensive experience of the method, that in my opinion it cannot succeed.

The other line of attack was that developed by our Chairman—an attack on the mosquito—and in 1902, he completely eradicated the disease from Ismailia by means of drainage. Almost at the same time, similar measures at Klang resulted in a degree of success which I must confess was as gratifying as it was beyond our expectations. These areas were, however, small, and the cost was considerable. Further, they did not touch the great rural areas—the real home of malaria. How was the great outbreak which had swept from end to end of the Selangor Coast to be controlled?

Well, in studying this malaria, I found in a certain area there had been a steady rise from 1895 to 1899, and a fall from 1899 to 1902. The percentage of malaria treated at the hospital of the area had risen from 23 per cent. to 59 per cent., and then again fallen to 23 per cent. No one could account for either the rise or fall, but a study of official reports showed that the construction of a road parallel to the sea had interfered with drainage, and that the inauguration of a drainage scheme had been followed by improvement. This seemed a reasonable explanation, and I published an account of the observation.

At this time there was considerable malaria at the Klang end of the road on the estates, and the planters complained that they could not drain their estates on account of the road. As a result of their representations, the Government voted \$110,000 for the Kapar drainage scheme, which provided for the drainage of 24,000 acres. From my point of view, this was an experiment on a large scale, and I did my best to profit by it. The first thing to be done was to get exact figures as to the amount of malaria present, and I accordingly made a series of blood examinations of children on the estates. A survey of the mosquitoes of the district was also made. To cut a long story short, it was found that malaria on the low alluvial coastal land was carried by a mosquito called *Anopheles umbrosus*, which breed in pools in the jungle; and that where the jungle was felled and the pools drained by open drainage, malaria completely disappeared, as shown by the health of the coolies improving, the admission to hospitals falling, the parasites disappearing from the blood of the children, and the percentage of

children with enlarged spleens falling from 100 to 0. It was also shown that the percentage of children with enlarged spleens (called spleen-rate) was in direct proportion to the proximity of their houses to the breeding-place of the mosquito—that is the jungle pool.

So we evolved the simple rule—that to avoid malaria on the low coastland, we had only to house our coolies half a mile from the jungle. In some cases, we moved coolies away from jungle; in other cases, we removed the jungle from the coolies' houses. The results were absolutely certain. In fact, health could be guaranteed, as has been demonstrated on many estates. To show how invariably this rule worked out, I must give you two instances which at first were puzzling. An old established estate became unhealthy: within eighteen months its labour force had fallen from 600 to about 300; the daily sick in hospital rose from two or three to seventy to a hundred—with a similar number of milder cases of fever on the estate. The spleen-rate rose from three to fifty-eight. The death rate rose from ten to eighty. The labour force was so reduced that the rubber trees could not be tapped, and the manager was 30,000 lb. short of the estimate. I was quite at a loss to account for the outbreak. The manager assured me none of the coolie lines (or barracks) were within half a mile of the jungle, and I could find no breeding-place near to the lines within the estate. Ultimately, I decided to walk over the whole estate, and round its boundaries. It was only then I found that the estate boundaries did not run, as I supposed, but bent so as to come close to two new lines which had been built eighteen months before.

There had been a redistribution of coolies, so that all the coolies were mixed up, and then, at first, I was unable to locate the trouble. Needless to say, the new lines were abandoned, and within a short time improvement began, and there is every prospect of a return to health.

The spleen-rate dropped within eight months from 58 to 17 per cent. That outbreak cost the estate £10,000 sterling. In the other case, a division of an estate became healthy; the spleen rate dropped from 50 to 5. Yet jungle remained some sixteen chains away as before. I was nonplussed at first, but said to the manager: "Something has happened to the jungle; mosquitoes are not breeding in it." Then he remembered that that very jungle had been drained by the neighbouring estate in connection with its water supply, but the trees had been left standing.

Finally, thousands of acres have been opened on some estates with hardly a case of malaria, as the labour has always been kept at least half a mile from the jungle face being opened. Now the importance of all this is that what was always regarded as the great stronghold of malaria, collapsed almost without a struggle. The low-lying clayland, with a high subsoil-water, was supposed to be the home of malaria, yet, as I have shown, we have the situation absolutely in our hands.

Again, the victory was as complete as our wildest hopes had dreamed. But just as our victory had been complete in the low flat land, we were at first as completely repulsed where we least expected it—namely, in the hill-land. We had always been taught that it was desirable to live on a hill if we wished to avoid malaria. Yet in the Federated Malay States, this is just the thing not to do in 999 cases out of a 1,000. And the reason is that malaria in the hill-land is carried by a mosquito which breeds in hill-streams, and cannot be abolished by open drainage. Its name is *Anopheles maculatus*.

When convinced this was so, we decided to put these streams underground for a certain distance round the habitations on the estates. The exact distance is probably about half a mile—as we found it necessary to house coolies that distance from jungle breeding-places on flat land. But in the interests of economy, I consider each estate should begin with a smaller area and work outwards. Estates were at once forthcoming with the money; Seafield, Glenmarie, and North Hummock were the pioneers.

The result was a complete success on North Hummock, where the area to be done was small; while on the other two, there has been a distinct improvement in health, but not as complete as we wish or intend to get.

Then the Government drained an extensive area in the Federal Capital, the result of which was excellent. In the words of the Principal Medical Officer's (Dr. Sansom) Annual Report:—"The results were immediate and completely satisfied the most sanguine anticipation.... It may safely be claimed that general infection is now non-existent within the drained area." This drained area was that occupied by the highest Government officials in the land and reserved for them. No fault could be found with their houses, food of the inhabitants or general sanitary arrangements. Yet malaria had been an absolute scourge, sparing not even the highest. I have said enough to show that we are now on sound lines in dealing with malaria on hill land. Many details remain to be worked out, but we have already had enough success to encourage us to press on with the work.

So far, I have dealt only with dry cultivation; now I want to turn your attention for a moment to the cultivation of rice. So long as people live in the East, rice will be required, and we cannot consider we have the victory until we can drive malaria from the rice field.

When I came to the conclusion that *A. Maculatus* intended to stay in our hill streams and valleys, it occurred to me that we might drive it out by making the water unsuitable for its peculiar tastes. Ross had already suggested substituting one anopheline for another in Mauritius by starving out the harmful one. Some mosquitoes like clean water, like *A. Maculatus*. Others like it muddy, and there is a series between the two. Well, I heard that rice fields were healthy, and it occurred to me that the cultivation drove out *A. Maculatus*. It was of comparatively little consequence if non-malaria carrying mosquitoes existed in the rice fields. I had no prejudice against any method which promised any help against malaria. I was even prepared to make the country a swamp if so we could get rid of the disease. So I investigated rice fields, and found 66,000 acres in Krian which were healthy. Only 27 per cent. of 718 children had enlarged spleen. But on coming to a valley in the hills I found a high degree of infection. *A. Maculatus* had been driven out, but other carriers had taken its place, so at the time I dropped this line of research.

It is, however, now being pursued by Dr. Strickland, the Travelling Entomologist in the F. M. S., and I am confident we will win in the end. We have always subsoil irrigation to fall back on.

Now I have shown that at least as regards dry cultivation we have established a working rule, if not a natural law, namely, that pool-breeding mosquitoes could be abolished by open drainage; that stream breeders could not be so abolished but required sub-drainage; that countries with no hill stream breeders would have no hill malaria. Was this true of the world? For, if so, it would give me a clearer idea of how the problem was to be

dealt with, and offer very high hopes of ultimate success. Turning to India first, I found a strong similarity to Malaya, namely, the plains of Bengal healthy, and the Duars at the foot of the Himalayas very malarious. Now that we have got right names to our mosquitoes we know that *A. Maculatus*, occurs in the Duars and in the Jyogore hills in Madras. It may not be the sole carrier, as *A. Christophersi*, also a stream breeder, is a proved carrier. But the reports state that *A. Maculatus* is the commonest anophèle in the upper portion of the Duars and lower hills. And in Ceylon it is also to be found.

Mr. Edwards of the British Museum kindly re-examined the Ceylon collection of insects and found it was present although misnamed. Severe malaria exists in the lower hills of Ceylon. Indeed for the whole country the spleen rate is 34 on over 92,000 children examined. Again *A. Maculatus* exists in Hong Kong; so we see wherever it exists malaria is severe.

Just across from the Malay Peninsula is Sumatra. In it the planters have established an excellent hospital system, and the death rate of the labour force does not usually exceed 10 per 1,000. I was naturally anxious to see this system, and Messrs. Harrison and Crosfield kindly arranged for me to see an extensive area in North-east Sumatra. It is impossible to go into details, but I failed to find any evidence of malaria in the hills; and no trace of *A. Maculatus* in hill streams. Practically the only malaria was along the fringe of mangrove on the coast. The country is volcanic, and has excellent drainage. Whether *A. Maculatus* is absent for geographical reasons, or for chemical reasons, I cannot definitely say, but the latter cannot be excluded. Sumatra must therefore be ranked as one of the healthiest countries of the tropical world--no small advantage.

At Washington I could not find any specimen of *A. Maculatus* in Dr. Clara Ludlow's collection, which she kindly allowed me to examine, nor have I seen any report on the Philippines which throws light on the distribution of malaria there.---*United Empire*.

(To be Continued.)

The Potash Industry.---This industry was on the whole satisfactory throughout 1912. The Potash Syndicate proved most useful in finding and opening up new markets for the ever-increasing output of potash; of late important markets were opened up in Russia, Canada and the Argentine. The following table shows the increase in the potash sales since 1909:—

Marks.			
1909	...	...	116,500,000
1910	...	...	146,500,000
1911	...	...	160,000,000
1912	...	...	177,000,000

The majority of the potash companies have been able to pay enhanced dividends for the year 1911. This is all the more surprising considering that the number of the companies has increased from 67 in 1911 to 107 in 1912.---*Diplomatic and Consular Reports, Germany*.

Coffee---Honduras possesses magnificent lands for the growing of coffee, and these can be bought at reasonable prices. At present, however, little is being done in this line of agriculture, as the lands suitable to its growth are, generally speaking, situated in the interior where transport difficulties render production unremunerative. There are, however, a few people planting on more or less large scales, anticipating the construction of railways.---*Diplomatic and Consular Reports—Honduras*.

LEGISLATION AND PLANT SANITATION.

In a recent issue we remarked upon the attempts which have, in times somewhat remote, been made to establish legislation in order to prevent the introduction of obnoxious weeds, pests, and diseases from foreign countries, and to prevent the spread of diseases, pests, and weeds from one estate to another in particular territories. We again approach this subject from the standpoint of plantation rubber growers. Legislation has long been in force to prevent the introduction of the pests and diseases we have mentioned, from one country to another. In certain countries the importation of certain plants is entirely prohibited; in others, plants are only admitted with a definite certificate as to freedom from disease. In other cases, consignments of plants are, on their arrival in the colonies, subjected to fumigation or other treatment, in order to destroy pests and diseases.

To bring the matter nearer home, we might remind our readers that the importation of potatoes attacked by wart disease is prohibited in Ireland, gooseberry and currant bushes and potatoes in Jersey, and vines in Austria-Hungary, Belgium, Bulgaria, Germany, Holland, Italy, Russia, Switzerland, Turkey, Algeria, Mauritius, Tunis and Chile. In Malta, a preference is shown, for we find the importation of vines is prohibited, except they come from the United Kingdom, and potatos except they come from Ireland. In Ceylon, Uganda, Grenada, and Dominica, etc., all plants may be admitted, but fumigation certificate from the authority at the port of shipment is necessary. On the other hand, we find that some countries have simply taken powers to prevent the introduction of insect fungns and other pests; whilst some countries—Newfoundland in particular—admit all plants, though even there the Governor-in-Council is empowered by the Potatoe Canker Act of 1910 to make regulations to control the importation of potatoes. Incidentally, we may mention that Canada prohibits the importation of potatoes from Newfoundland.

IMPORTATION TO CEYLON AND STRAITS SETTLEMENTS.

As we have previously remarked, all plants may be admitted into Ceylon, subject to being fumigated on landing. The particulars specify that living plants, tubers, roots, and certain fruit trees shall be treated with hydrocyanic acid gas, or such other treatment as may be deemed necessary by the Government zymologist. But wardian cases and other securely closed packages of plants, addressed to the Botanic Gardens, may be forwarded direct to that centre, and fumigated on their arrival.

So far, however, these regulations only prevent the introduction of insect pest, they do not prevent the introduction of fungi or obnoxious weeds. It may be that there has been some more recent legislation with regard to Ceylon, which has had under consideration the fungi and weeds referred to. In the Straits Settlements the Governor is empowered to make laws prohibiting or regulating the landing in the colonies of trees, plants, etc., all of which refer to tropical products.

LEGISLATION FOR ESTATES ONLY.

It seems so reasonable to enforce legislation with regard to the introduction of plants in the various colonies, that the point hardly commands further discussion. It does, however, lead us to a consideration of possible legislation for estates themselves. We are all aware that diseases, pests, and weeds are to be found in every colony, but certain estates are practi-

cally free from weeds, others have the pests and diseases well in hand, whilst many, especially those owned by natives, are sometimes allowed to become a perfect seed bed for weeds and various injurious insects and fungi.

Many planters are at the present time taking every possible step to prevent the spread of root, stem, and fruit disease of *Hevea brasiliensis*. Some companies have gone to a very large expenditure in fighting Fomes on the roots, and bark canker on the stem. The life histories of most of the harmful fungi and insects are moderately well known, and specific instructions are available for every planter who wishes to keep the undesirable organisms down to the minimum. These introductions have in part or wholly been adopted on the estates, and improved upon from time to time so that there is no real excuse, so far as known diseases and pests are concerned, for any planter who claims to be up-to-date. Unfortunately there are many planters to be found who have either not got the means in the form or cash or labour to fight these pests, or they are unwilling to do so. It does not on the face of it, seem right that the labour and money used by-to-date planters should be wasted through lack of attention of his neighbour; hence the question arises as to whether legislation of some kind or another could be framed which would compel every planter to attend to diseases and pests.

COMPENSATION AND RIGHT OF INSPECTION.

The subject is by no means a small one. It opens up first the question of right of entry for any duly appointed inspector. It also raises the serious question of compensation when an inspector does the work for an estate under compulsion, or when he actually destroys a number of plants which are assessed at some particular value by the owner. The subject was once well discussed in connection with cocoa canker in Ceylon, but very little headway seems to have been made with the diseases of that particular plant. Nevertheless, we cannot see that there is any injustice in legislation of the kind we suggest. Certainly no one would deny that one village may suffer from the neglect of an adjacent village, and no one would be permitted to endanger the health of other animals without some check. If it is reasonable to enforce legislation with respect to animals either human or otherwise, it is surely equally logical to suggest somewhat similar measures to deal with plants.

We are endeavouring to get details of legislation which has been outlined to deal with pests and diseases in other countries. We feel that while we know how to treat known diseases there may quite conceivably come a time when diseases of a far more dangerous character may arise. If there is then no combination among planters the result may be disastrous. In any case we can see no harm resulting from ventilating this subject at the present juncture.

WHAT IS DONE IN CANADA.

We need not go very far to learn something of the methods adopted by other countries. The Department of Customs, Canada, issued in July of last year particulars of the regulations which are in force. In Canada plants must be fumigated on their arrival, except the Minister of Agriculture allows them to pass through exempt. If on inspection nursery stock is found to be infested with specified insects, pests, or diseases, it is destroyed to the extent deemed necessary by the inspector and in his presence. Furthermore, any inspector entering any land or property where he has reason

to believe certain pests or diseases are present has the power to give instructions for the treatment or destruction of any affected plant. These instructions have to be carried out by the owner of the affected vegetation, and continued until the inspector is satisfied that the pests and diseases have been exterminated. Compensation not exceeding two-thirds of the value as assessed by the inspector of the plants destroyed under his instructions may be granted by the Government. Furthermore, in Canada it is illegal to sell or offer for sale any plants affected with specified insects, pest or diseases. We know of no such legislation in the Middle East.

It is probable that any legislation which might hereafter be put forward for application in the tropics would deal only with specific pests and diseases of a character more dangerous than those now existing. We think it is well worth considering whether the legislative councils in the various colonies in the Middle East have the power to put into force legislation for use on estates only. We shall return to this subject in a later issue. *The India-Rubber Journal.*

Mr. T. Southwell, Deputy Director of Bengal Fisheries, being impressed with the commercial possibilities of the local fishing industry, has decided to give a lecture on the subject, and the Chamber of Commerce has issued a circular with the idea of getting together an audience of the kind to whom such an address is likely to make a direct appeal. The sort of people Mr. Southwell wishes to talk to are those who "could be induced, as a result of the lecture, to consider the feasibility of investing money in the project." There is not a great deal of capital available for investment at the moment, but the fishing industry, as a potential source of dividends, is undoubtedly worth considering.

As a matter of fact, an attempt to exploit the Bengal fisheries was made fifteen or twenty years ago, a local firm being the managing agents of the enterprise, while the name of the concern was the Bengal Fisheries Co., Ltd. One of the chief promoters was Capt. J. H. Row. There was much disappointment because this business failed. Capt. Row wrote to us in 1897: "The experimental working of the Bengal fisheries was a success; it was at my own expense I printed and circulated the result of the work done to the 74 gentlemen who subscribed; and also pointed out at the time that £100,000 per annum could be derived (from the fisheries) in the Bay of Bengal alone, and I am in a position now to show that from 20 per cent, to 40 per cent. of this will be clean profit to any company with sufficient capital to work it." Alas and alack, this company did not succeed. The fish were good but difficulties attended their successful marketing. It does not follow that the failure need be repeated, but the incident illustrates the need for caution.

Sir Frederick Nicholson, in a pamphlet published in 1907, drew attention to the remarkable success of the fishing industry in Japan owing to the energy and intelligence of both Government and people, their close co-operation the recognition of the importance of education, primary and industrial, and a number of other factors. In India the circumstances are not the same. "In India we have an industry equally primitive with that of the Japanese before 1857, a fishing population less numerous, less hardy, less adventurous, less adaptive, and more readily content with that which is; infinitely suspicious of Government interference yet almost incapable of initiative or of serious new departures without such intervention." No doubt, when he lectures, Mr. Southwell will tell us to what extent, if any, these unfavourable conditions have been modified.—*Capital.*

CORRESPONDENCE.

Mysore, 21-12-13.

Green Bug.

THE EDITOR.

The Planters' Chronicle.

Bangalore.

Dear Sir,—Mr. Danvers wrote some time ago to try and find out why the Shevaroys have suffered comparatively slight damage from green bug. But, is that the case?

Mr. Fletcher saw a small part of one district at a uniform elevation of over 4,000 feet and estates of an age of 23 years and over and deduced from them that little damage was done.

The owners of these estates are no doubt in a position to say that though they have lost a good percentage of crop each year from bug, no permanent damage has been done except to bored trees and young clearings.

Below 4,000 feet considerable damage has been done by bug, patches and in some cases acreages being practically wiped out. Except in the case of young coffee, the chief cause on these hills of permanent damage by bug is and has been borer. A good healthy tree shakes off bug and except for a temporary loss of crop is none the worse, but a bored tree fares badly.

Bored trees, unless badly injured, are commonly left on the Shevaroys and they recover and give good crops in a way they do not seem to do in Mysore, but they are only outwardly strong, and an attack of bug shows up their constitutional weakness.

If an examination was made of all the estates in the Shevaroys, it could be shown that, though brushing and spraying are very desirable and necessary, they are largely a waste of time and money unless borer is taken in hand too. I have seen an estate on these hills so bad with bug that it looked moribund, but a year after it had completely recovered, due in my opinion to its not being bored.

It may very likely be disputed that green bug and borer are a fatal combination and they may not be everywhere, but they most certainly are in many cases. To give instance, let me mention 3 of the blocks on an estate here.

No. I, 30 acres planted in 1898, and bored throughout before the shade grew up. The borer had apparently done no permanent damage but the whole block died out in one season from green bug in spite of brushing.

No. II, 60 acres planted in 1903 and 1904. This had shade planted with the coffee and borer removed annually and has hardly suffered from bug at all.

No. III, 25 acres planted in 1907. This, when 3 years old, was killed out by bug in a few weeks, but was not bored. In this case mealy bug, which was very virulent for one year and has hardly been seen before or since, was mainly responsible. Number three is only mentioned as showing how young coffee may suffer from bug in spite of precautions, but it is a fairly plausible deduction that, if No. I had not been bored, it would have weathered the storm as block II has.

Yours faithfully,

B. CAYLEY.

